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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/894,073	06/28/2001	Julie Ann Watts	SVL9-2001-0002US1/2021P	6518

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EXAMINER

GODDARD, BRIAN D

ART UNIT	PAPER NUMBER
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2161

DATE MAILED: 03/17/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/894,073	WATTS, JULIE ANN	
	Examiner	Art Unit	
	Brian Goddard	2161	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 15 November 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-18 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-18 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 28 June 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. This communication is responsive to the Amendment filed 15 November 2004.
2. Claims 1-18 are pending in this application. Claims 1, 8, 9 and 16-18 are independent claims. In the Amendment filed 15 November 2004, no claims were added canceled, or amended. This action is made Final.

Claim Rejections - 35 USC § 103

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

3. Claims 1-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over the article entitled, "ARIES: A Transaction Recovery Method Supporting Fine-Granularity Locking and Partial Rollbacks Using Write-Ahead Logging" by Mohan et al. (hereinafter "Mohan") in view of U.S. Patent No. 5,983,225 to Anfindsen.

Referring to claim 1, Mohan discloses a method for selectively releasing locks on data as claimed. See sections 1.2-1.3, 2 and 5 for the details of this disclosure. Mohan teaches a method for selectively releasing locks on data, comprising the steps of:

(a) providing at least one savepoint [SaveLSN (See section 5.2)] in a transaction, wherein a first lock [write/update lock] and a second lock [read lock] are acquired after the at least one savepoint [See first full paragraph on page 120], wherein the first lock is assigned to the at least one savepoint;

(b) rolling back the transaction [See Fig. 8] to the at least one savepoint; and

(c) releasing any locks [See first full paragraph on page 120] assigned to the at least one savepoint, wherein the first lock is released.

Mohan does not explicitly teach the second lock being “assigned to the transaction” and being maintained (as with any locks assigned to the transaction) after rolling back the transaction to the at least one savepoint as claimed. This however, is only because Mohan is silent on differentiation between locking/unlocking procedures during rollback being that the paper deals only with recovery after a system failure.

Anfindsen teaches a system and method similar to that of Mohan, including repeatable read and transaction consistency isolation wherein all read locks acquired by a transaction are assigned to the transaction and maintained until commit or abort, even if the transaction rolls back to a savepoint prior to the point of acquiring the read lock. See column 9, lines 25-67 of Anfindsen’s specification for this disclosure. Anfindsen discloses the purpose of this practice to ensure that read data will not change until the transaction terminates (i.e., a read that is repeated will return the original row, unchanged).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to add Anfindsen’s repeatable read and transaction consistency isolation procedures to the system and method of Mohan by assigning any read lock(s) [“second lock” in claim language] acquired after any given savepoint to the transaction and maintaining these locks until commit or abort. One would have been motivated to do so in order to expand Mohan’s system to deal with partial rollbacks caused by the transaction itself instead of just for failure recovery, guaranteeing that read data would

not change until the transaction terminated, as provided by Anfindsen. One would have been further motivated to combine these references because of Mohan's disclosure of the importance of repeatable read in transaction recovery (See pages 144-145) and Anfindsen's disclosure of the importance of partial rollback to a savepoint (See columns 2 and 14).

Referring to claim 2, the system and method of Mohan in view of Anfindsen as applied to claim 1 above discloses the invention as claimed. See the portions of the references cited above for the details of this disclosure. Mohan v. Anfindsen teaches the method of claim 1, as above, wherein the providing step (a) comprises: (a1) providing a sequence of savepoints [Mohan: See section 5.2] in the transaction, wherein the first lock [write/update lock] is assigned to one of the sequence of savepoints [the savepoint immediately preceding it (Mohan: See section 5.2)] and the second lock [read lock] is assigned to the transaction [See above] as claimed.

Referring to claim 3, the system and method of Mohan in view of Anfindsen as applied to claim 1 above discloses the invention as claimed. See the portions of the references cited above for the details of this disclosure. Mohan v. Anfindsen teaches the method of claim 1, as above, wherein the rolling step (b) comprises: (b1) rolling back the transaction to one of a sequence of savepoints [Mohan: See section 5.2, particularly the first full paragraph on page 120] as claimed.

Referring to claim 4, the system and method of Mohan in view of Anfindsen as applied to claim 1 above discloses the invention as claimed. See the portions of the

references cited above for the details of this disclosure. Mohan v. Anfindsen teaches the method of claim 1, as above, wherein the releasing step (c) comprises:

(c1) releasing the first lock assigned to one of a sequence of savepoints to which the transaction is rolled back [Mohan: See section 5.2, particularly the first full paragraph on page 120]; and

(c2) releasing any locks assigned to subsequent savepoints [Mohan: See same section], wherein the second lock assigned to the transaction [See discussion of claim 1 above] and any locks assigned to preceding savepoints [Mohan: See same section] are maintained.

Referring to claim 5, the system and method of Mohan in view of Anfindsen as applied to claim 4 above discloses the invention as claimed. See the portions of the references cited above for the details of this disclosure. Mohan v. Anfindsen teaches the method of claim 4, as above, further comprising: (c3) releasing another of the sequence of savepoints [Mohan: a prior savepoint (SaveLSN) during a second/nested rollback OR a subsequent savepoint (SaveLSN) from the one to which the transaction was rolled back] as claimed.

Referring to claim 6, the system and method of Mohan in view of Anfindsen as applied to claim 5 above discloses the invention as claimed. See the portions of the references cited above for the details of this disclosure. Mohan v. Anfindsen teaches the method of claim 5, as above, further comprising: (c4) reassigning at least one lock [Mohan: See section 5.2] assigned to the another of the sequence of savepoints [accomplished by the PrevLSN & UndoNxtLSN fields (pointer(s) to the most recent

savepoint after rollback) in undone (CLR'd) log records] to a preceding savepoint [the most recent savepoint after rollback (i.e. the savepoint (SaveLSN) to which the transaction was rolled back)] as claimed.

Referring to claim 7, the system and method of Mohan in view of Anfindsen as applied to claim 5 above discloses the invention as claimed. See the portions of the references cited above for the details of this disclosure. Mohan v. Anfindsen teaches the method of claim 5, as above, further comprising: (c4) maintaining knowledge of the released another of the sequence of savepoints [in the transaction log (Mohan: See sections 3 & 5.2)], such that if the transaction is rolled back to a preceding savepoint, the at least one lock assigned to the released another of the sequence of savepoints is released [See discussion of claims 5 & 6 above] as claimed.

Claim 8 is rejected on the same basis as claims 1-4. See the discussions regarding claims 1-4 above for the details of this disclosure.

Claims 9-15 are rejected on the same basis as claims 1-7 respectively. See the discussions regarding claims 1-7 above for the details of this disclosure. In particular, Mohan's (as modified by Anfindsen) method described with regard to claims 1-7 above is implemented on a computer readable medium as claimed. See section 13.1 of Mohan's article for the details of this disclosure.

Claim 16 is rejected on the same basis as claim 8. See the discussions regarding claims 8-15 above for the details of this disclosure.

Claim 17 is rejected on the same basis as claim 1. See the discussion regarding claim 1 above for the details of this disclosure. See also section 13.1 of Mohan's article for the disclosure of the "system".

Claim 18 is rejected on the same basis as claim 17. See the discussions regarding claims 1 and 17 above, as well as the relevant portions of the references cited therein, for the details of this disclosure.

Response to Arguments

4. Applicant's arguments filed 15 November 2004 have been fully considered but they are not persuasive.

Referring to applicant's remarks on pages 8-10 regarding the Section 103 rejections of the independent claims: Applicant argued that the combination of Mohan and Anfindsen does not disclose selectively assigning locks either to the savepoint or the transaction, and then releasing the locks assigned (or "owned") by a savepoint when the transaction is rolled back to the savepoint, where the locks assigned by the transaction are maintained. Applicant's reasons include: "By assigning locks to savepoints or transaction [sic], as with the present invention, the lock manager can release locks based on this assignment or "ownership", without requiring a per-lock examination. Overhead is thus reduced."; and "Maintaining or releasing of locks based on assignment or ownership cannot be inferred by the mere fact that certain locks are released after a rollback occurs while other locks are maintained. Without actually assigning the locks in the above described manner and releasing locks based on these assignments, the overhead savings resulting from the present invention cannot be realized by Mohan in view of Anfindsen."

The examiner disagrees for the following reasons:

Applicant's arguments all hinge on the claimed "assignment" of locks to a savepoint or transaction. Thus, the pivotal consideration here is the definition of the term "assigned." During patent examination, the pending claims must be given their broadest reasonable interpretation consistent with the specification¹ as required by MPEP § 2111. This means that the terms of a claim must be given their "plain meaning" unless a clear definition has been provided in the specification² as per MPEP § 2111.01.

In the instant case, there is absolutely no definition of "assigned" or "assignment" in the instant specification. In fact, there is absolutely no written description or enabling disclosure of how "assignment" of locks is implemented anywhere in the instant specification. The specification merely states that certain locks (namely "read" locks) are "assigned" to a transaction, while certain other locks ("write" locks) are "assigned" to a savepoint. This describes WHICH locks are "assigned" to WHICH level (transaction or savepoint), but now HOW "assignment" is accomplished. If the crux of applicant's instant invention is the "assignment" of locks to either a savepoint or a transaction in order to reduce overhead, then why is there no description of how this "assignment" is implemented? For example, is a lock somehow logically connected to a savepoint instead of a transaction? How is this accomplished? The instant specification provides NO enabling disclosure that would allow one of skill in the art to answer these questions.

¹ See *In re Hyatt*, 211 F.3d 1367, 1372, 54 USPQ2d 1664, 1667 (Fed. Cir. 2000).

² See *In re Zletz*, 893 F.2d 319, 321, 13 USPQ2d 1320, 1322 (Fed. Cir. 1989); and *In re Vogel*, 422 F.2d 438, 441, 164 USPQ 619, 622 (CCPA 1970).

As a consequence of this lack of description, the specification also lacks enabling disclosure that would apprise one of skill in the art as to HOW the locks are released “without requiring a per-lock examination” as applicants have argued. Thus, there is no evidence of a reduction of overhead, only general allegations that it is so.

Because the instant specification provides no definition or description of “assignment”, the Office is left to interpret this “assignment” as broadly as reasonably possible. First, it is noted that “assignment” does not require “ownership.” Applicant’s remarks frequently use “ownership” and “owned” to attempt to distinguish from the combination of references, as if a transaction “owns” some locks, while a savepoint “owns” others. However, such “ownership” is not mentioned even once in the instant specification. Second, a reasonable “plain meaning” for the term “assignment” is not easy to establish, as “assignment” is extremely broad and can carry many interpretations by those skilled in the art.

Since the disclosure of the instant specification is at a very high level, including little or no implementation details, applicant has clearly left room for significant interpretation by those of skill in the art. Therefore, the same standard applied to the instant specification has been applied to the prior art. In the combination of Mohan and Anfindsen, ALL read locks are held until commit in order to maintain repeatable read consistency, just as in the instant specification. Thus, the Office considers that, in the combination, when a read lock is acquired, it is “assigned” to the transaction to be maintained until commit by virtue of the fact that it is a read lock. Next, in the combination of Mohan and Anfindsen, ALL write/update locks acquired after a savepoint

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are released upon rollback to that savepoint, while all write/update locks acquired prior to that savepoint are held, just as in the instant specification. Thus, the Office considers that, in the combination, when a write/update lock is acquired, it is "assigned" to the preceding savepoint by virtue of the fact that it is a write/update lock.

This interpretation is certainly reasonable because it applies the same standard to the prior art that has been applied to the instant application. Therefore, the combination of Mohan and Anfindsen discloses each and every limitation of applicant's claimed invention. The rejections are maintained.

Conclusion

5. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

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6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Brian Goddard whose telephone number is 571-272-4020. The examiner can normally be reached on M-F, 9 AM - 5 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Safet Metjahic can be reached on 571-272-4023. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

bdg
11 March 2005


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